

To: Eric Bowman
Environmental Quality Management

Date: October 27, 2011

From: Brian Boyer
Mark Kieser
Kieser & Associates, LLC

cc: Project files

RE: Portage Creek Area Time Critical Removal Action
Project# 030281-0087
Existing Vegetation Assessment

Introduction

Kieser & Associates, LLC (K&A) has been retained by Environmental Quality Management, Inc. (EQM) to provide professional services for an existing vegetation assessment, re-vegetation planning and re-vegetation monitoring associated with the Portage Creek Area Time Critical Removal Action Project in Kalamazoo, Michigan. This technical memorandum summarizes the findings from the first K&A work task associated with existing vegetation assessment efforts.

The Portage Creek project begins at East Alcott Street and will proceed north approximately 1.8 miles to the confluence with the Kalamazoo River. These operations will involve limited clearing and grubbing to provide access for contaminated sediment removal efforts within Portage Creek. Therefore, K&A vegetation assessment efforts were focused on specific riparian areas identified by EQM. Vegetation identification involved emergent and terrestrial plants. The following table summarizes each of the proposed work sites.

Removal Area	Channel Center Length (in feet)	Surface Area of Removal (in acres)
SA 1-A	252	0.45
SA 1-B	52	0.03
SA 1-C	231	0.18
SA 3-A	348	0.41
SA 5-A	447	0.32
SA 5-C	404	0.32
SA 5-Axtell Creek	507	0.23
SA 5-D	989	0.84
SA 6	915	0.72
SA 7	267	0.26
Total	4,412	3.76

A site location map depicting the location of each Portage Creek sediment removal work site, with respect each other and local surrounding features, is provided as Figure 1.

Work Summary and Findings

K&A personnel accessed each proposed sediment removal work site on foot to assess the existing vegetation species present within the designated future clearing and grubbing areas defined by EQM. This vegetation evaluation was a qualitative assessment of the vegetation and community type present at each proposed work site. In general, existing vegetation observed was quite typical of species located within an urban floodplain and riparian forest community.

Field notes were recorded for each site to document existing plant species observed, large trees present and general community type. Vegetation observed by K&A personnel at each site were referenced against the Michigan Natural Features Inventory list of Michigan's Special Plants (MNFI, 2010). None of the existing vegetation species observed within the proposed Portage Creek work sites were listed on the Michigan Special Plants list. With the exception of Site SA1-B, all sites had at least one exotic species present (i.e., not native to Michigan).

A summary of all existing vegetation species observed within the ten future clearing and grubbing areas along Portage Creek is provided as Table 1 and Table 2 for native and exotic plants, respectively. An “x” within each summary table indicates vegetation species present at each site. Both the common name and scientific name are provided for each species observed wherever possible.

Some examples of predominant existing native vegetation (common to several sites) include:

- Silver Maple
- Staghorn Sumac
- Poison Ivy
- Virginia Creeper
- Grapevine
- Green ash
- Swamp rose mallow
- Common ragweed
- Northern catalpa
- American elm
- Box elder
- Red maple
- Late goldenrod
- Black willow
- Eastern cottonwood

A few of these predominant native species are undesirable for future re-vegetation planning. These undesirable natives include: poison ivy (allergen to some people), green ash (susceptible to the ash borer) and common ragweed (allergen to some people). Other natives that were observed at a few sites that will be excluded from future re-vegetation planning include:

- Green foxtail (can be invasive)
- Pokeweed (poisonous to humans)
- Hedge bindweed (appears on MI noxious species list)

Some examples of predominant existing exotic vegetation (common to several sites) include:

- Common buckthorn
- Purple loosestrife
- Stinging nettles
- Nightshade
- Reed canary grass

All of the observed exotic vegetation is undesirable for future re-vegetation planning and will be excluded from such consideration.

Detailed site location maps and vegetation summary tables unique to each of the ten proposed future work sites are provided as Figures 2 through 11. Select photographs were also taken to document conditions at each location (refer to Attachment A).

This existing vegetation information will be relied upon for the next K&A work task: preparation of re-vegetation design plans. It is our understanding that EQM will also use this information to solicit local stakeholder input related to desired re-vegetation species for each of the ten Portage Creek work sites.

References

Michigan Natural Features Inventory (MNFI) list of *Michigan's Special Plants: Endangered, Threatened, Special Concern and Probably Extirpated*, August 26, 2010.

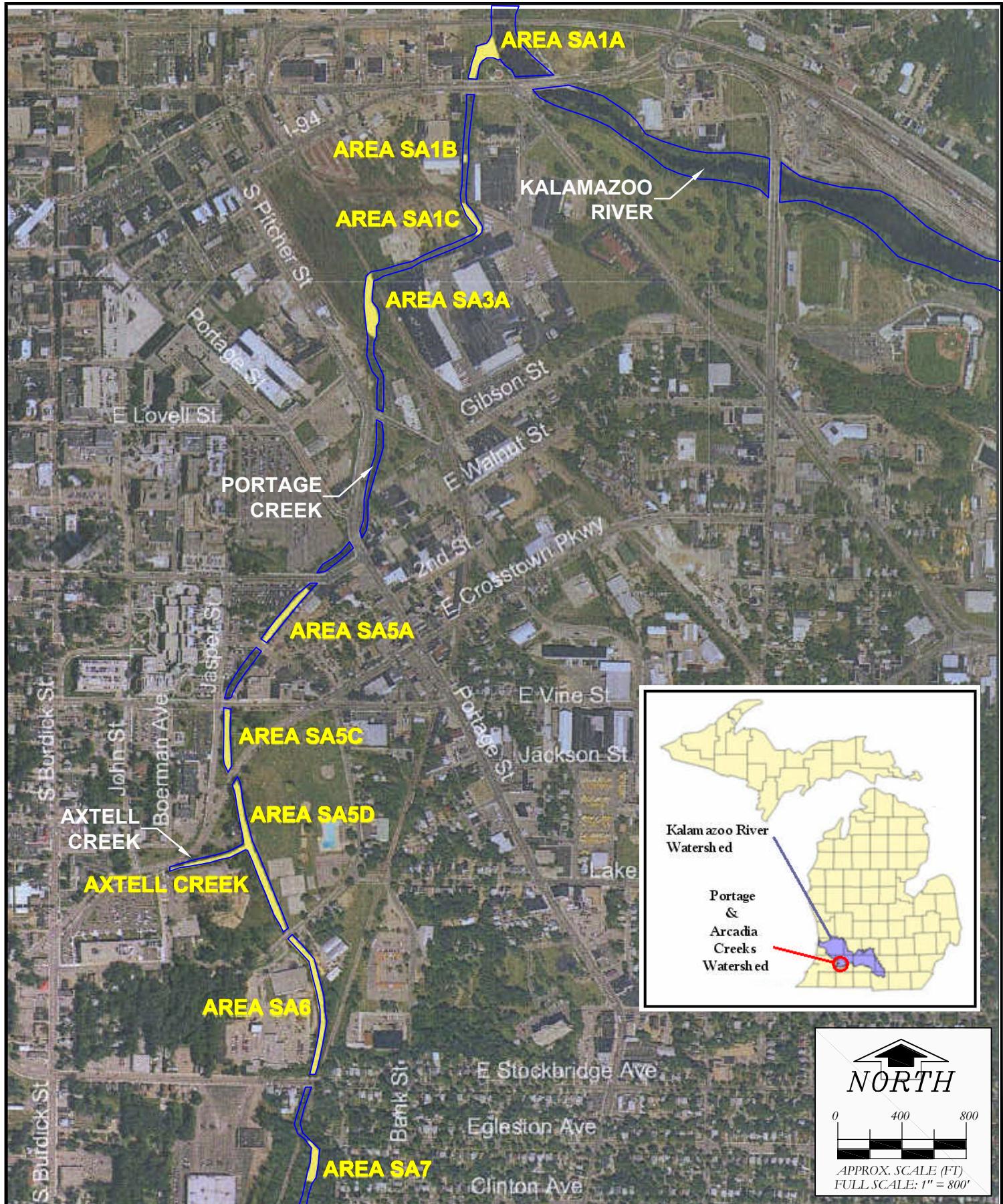
Michigan Department of Agriculture and Rural Development Website. Prohibited and Restricted Noxious Weed Seeds. <http://www.michigan.gov/mdard/0,4610,7-125-1568_2390_41275-149078--,00.html>

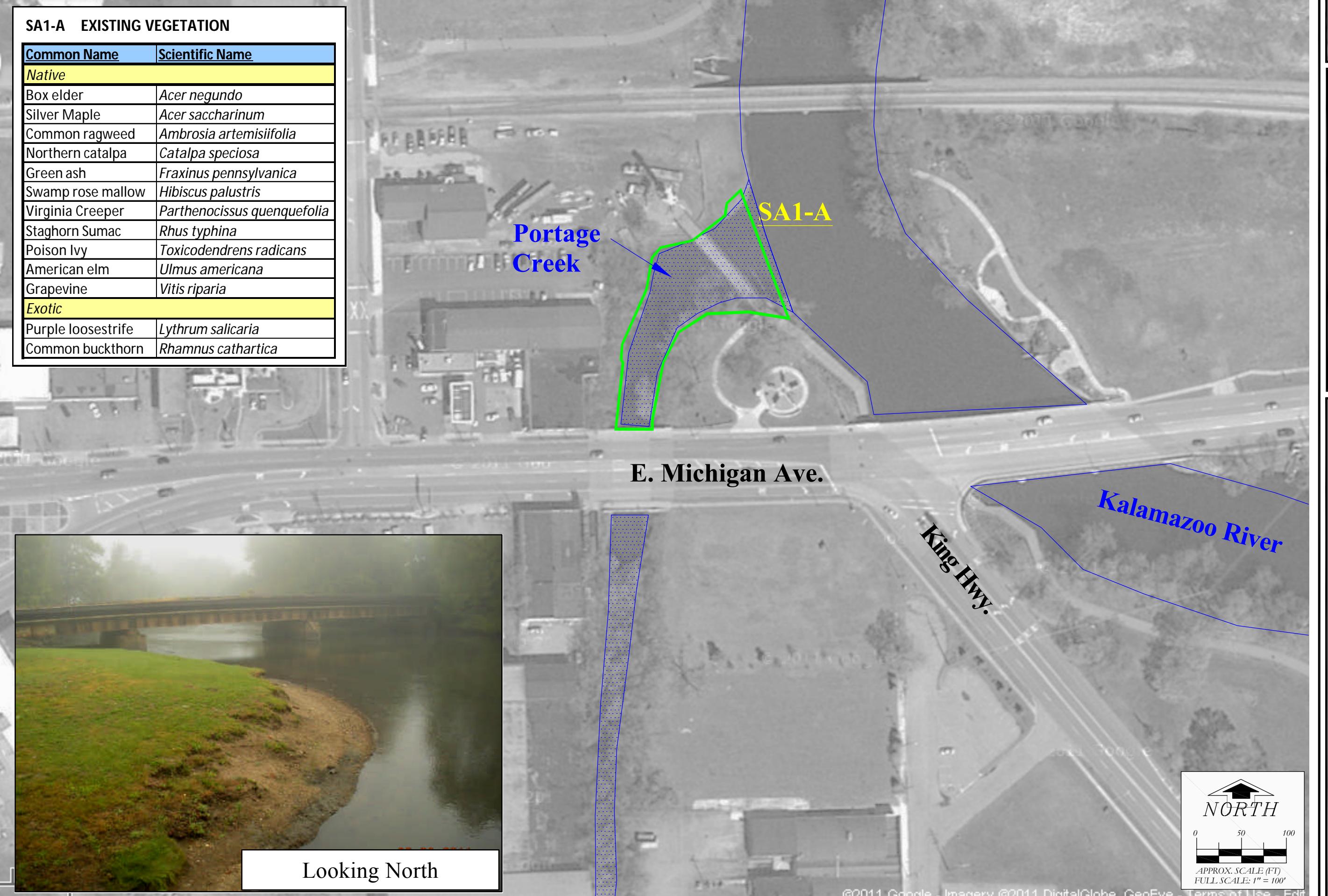
Table 1. Summary of Observed Native Vegetation at All Proposed Work Sites along Portage Creek in Kalamazoo, MI.

Common Name	Scientific Name	Site Number									
		SA1-A	SA1-B	SA1-C	SA3-A	SA5-A	SA5-C	SA5-D	SA5-Axell	SA6	SA7
Native											
Silver Maple	<i>Acer saccharinum</i>	x	x	x	x		x	x		x	x
Staghorn Sumac	<i>Rhus typhina</i>	x		x	x	x		x		x	x
Poison Ivy	<i>Toxicodendrenis radicans</i>	x	x	x	x		x	x		x	x
Virginia Creeper	<i>Parthenocissus quenquefolia</i>	x			x		x	x	x	x	x
Grapevine	<i>Vitis riparia</i>	x					x	x	x	x	x
Green ash	<i>Fraxinus pennsylvanica</i>	x	x	x	x	x	x	x	x	x	x
Swamp rose mallow	<i>Hibiscus palustris</i>	x	x			x		x	x	x	
Common ragweed	<i>Ambrosia artemisiifolia</i>	x			x		x	x	x		
Northern catalpa	<i>Catalpa speciosa</i>	x	x	x	x	x	x	x	x	x	
American elm	<i>Ulmus americana</i>	x		x	x	x	x	x	x	x	x
Box elder	<i>Acer negundo</i>	x	x		x		x	x	x	x	x
Red maple	<i>Acer rubrum</i>	x	x		x		x	x	x		
Late goldenrod	<i>Solidago gigantea</i>		x	x			x	x	x		
Black willow	<i>Salix nigra</i>		x				x	x	x		
Eastern cottonwood	<i>Populus deltoides</i>		x	x	x	x	x	x	x	x	x
White thoroughwort	<i>Eupatorium leucolepis</i>		x	x	x			x	x	x	x
Smartweed	<i>Polygonum coccineum</i>		x								
Thin-leaved coneflower	<i>Rudbeckia triloba</i>			x							
Wood sorrel	<i>Oxalis montana</i>			x							
Green foxtail	<i>Setaria viridis</i>			x							
Fowl meadow grass	<i>Glyceria striata</i>			x							
Violet	<i>Viola sp.</i>			x						x	
Washington hawthorn	<i>Crataegus phaenopyrum</i>			x		x				x	
Blue flag iris	<i>Iris versicolor</i>			x		x				x	
Evening primrose	<i>Oenothera biennis</i>			x		x	x				
Rush aster	<i>Aster junciformis</i>			x		x	x				
Common milkweed	<i>Asclepias syriaca</i>			x		x			x		
Aster sp.	<i>Asteraceae</i>			x						x	
Crab apple	<i>Malus sp.</i>			x		x					
Arrowhead	<i>Sagittaria latifolia</i>				x						
Water pepper (smartweed)	<i>Polygonum hydropiper</i>				x						
Honey locust	<i>Gleditsia triacanthos</i>				x		x		x		
Elderberry	<i>Sambucus canadensis</i>				x	x	x	x	x		
Hedge bindweed	<i>Convolvulus sepium</i>				x						
Jewelweed	<i>Impatiens capensis</i>				x	x				x	
Swamp milkweed	<i>Asclepias incarnata</i>				x						
Sweet coneflower	<i>Rudbeckia subtomentosa</i>				x						
Pokeweed	<i>Phytolacca americana</i>				x	x		x			
Bur Oak	<i>Quercus macrocarpa</i>				x						
Kentucky bluegrass	<i>Poa pretensis</i>					x					
Hedge nettle	<i>Stachys sp.</i>					x					
Horse nettle	<i>Solanum carolinense</i>					x					
Sassafras	<i>Sassafras albidum</i>						x				
Black walnut	<i>Juglans nigra</i>						x				
Pin oak	<i>Quercus palustris</i>							x			
Raspberry	<i>Rubus sp.</i>					x		x		x	
Turf grass						x		x		x	

Table 2. Summary of Observed Exotic Vegetation at All Proposed Work Sites along Portage Creek in Kalamazoo, MI.

Common Name	Scientific Name	Site Number								
		SA1-A	SA1-B	SA1-C	SA3-A	SA5-A	SA5-C	SA5-D	SA5-AxteII	SA6
Exotic										
Common buckthorn	<i>Rhamnus cathartica</i>	x		x	x	x	x	x	x	x
Purple loosestrife	<i>Lythrum salicaria</i>	x	x		x	x	x	x	x	
Stinging nettles	<i>Urtica dioica</i>				x	x	x			x
Nightshade	<i>Solanum dulcamara</i>			x	x	x				
Common mullein	<i>Verbascum thapsus</i>			x					x	
Queen Anne's lace	<i>Daucus carota</i>			x			x			
Reed canary grass	<i>Phalaris arundinacea</i>			x		x	x		x	x
Myrtle	<i>Vinca minor</i>		x			x	x		x	x
Tree of Heaven	<i>Ailanthus altissima</i>			x		x				
Curled dock	<i>Rumex crispus</i>			x						
Chicory	<i>Cichorium intybus</i>				x		x			
Honeysuckle	<i>Lonicera sp.</i>					x	x			
Autumn olive	<i>Elaeagnus umbellata</i>					x				
Teasel	<i>Dipsacus sylvestris</i>					x				
Burning bush	<i>Euonymus atropurpureus</i>					x		x		
Ground ivy	<i>Glechoma hederacea</i>					x				
Broad dock	<i>Rumex obtusifolius</i>					x			x	
Field sow thistle	<i>Sonchus arvensis</i>					x				
Japanese knotweed	<i>Fallopia Japonica</i>							x		
Burdock	<i>Arctium minor</i>									x
Black jetbead	<i>Rhodotypos scandens</i>						x			



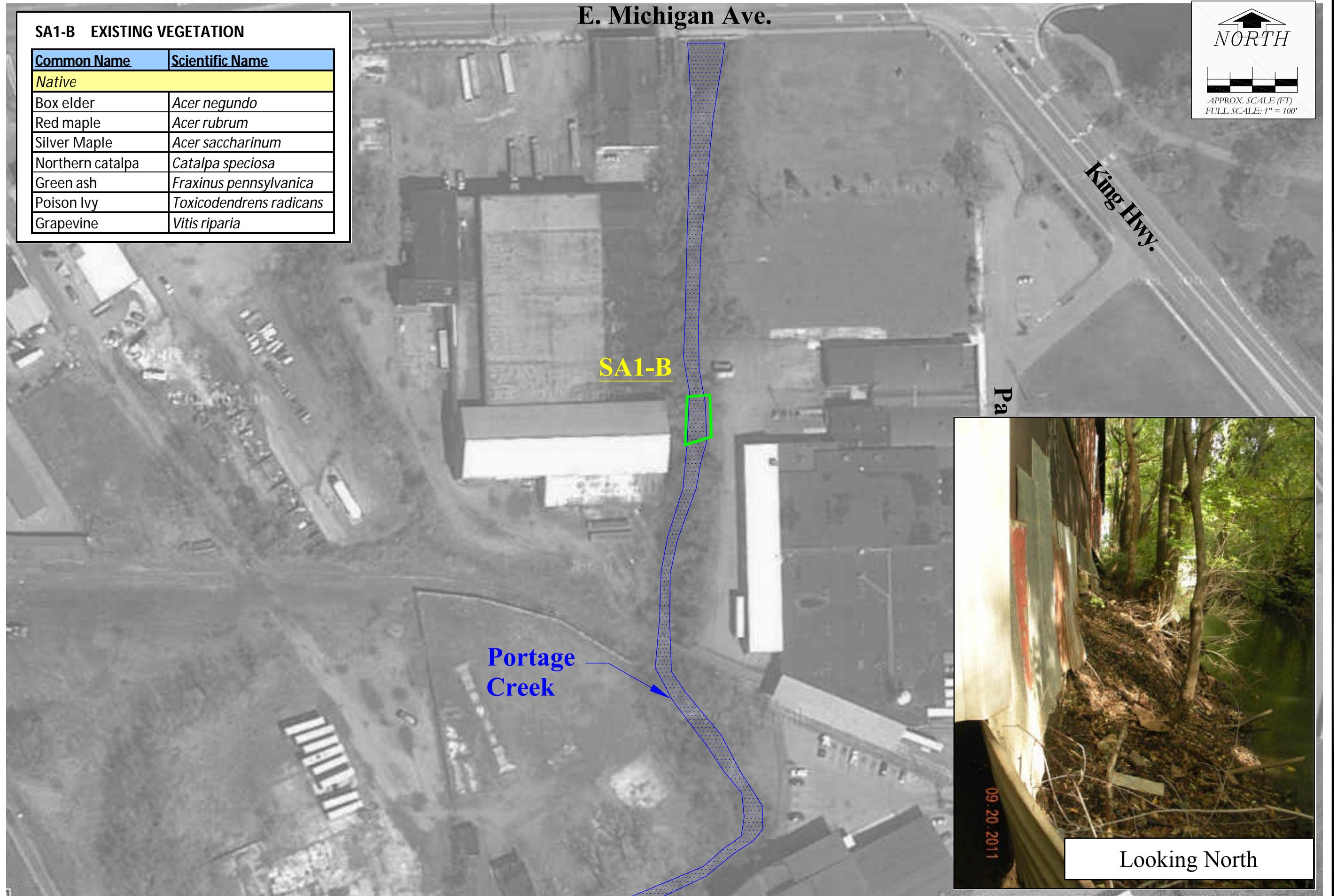


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FIGURE 2

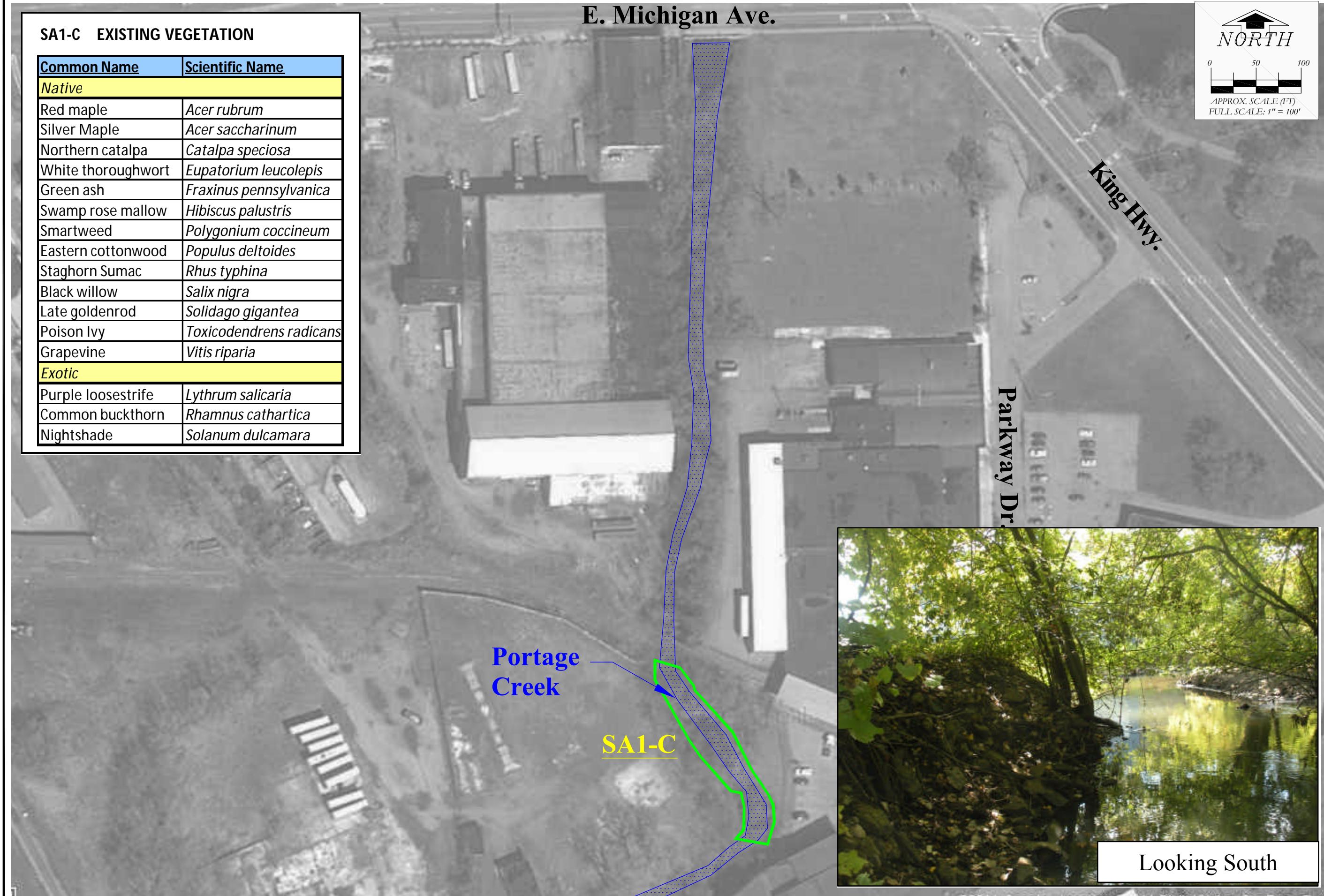
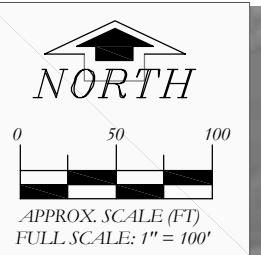
Portage Creek Area Time Critical Removal Action
KALAMAZOO, MI
EQM Project Number: O3O281.0087
PORTAGE CREEK SITE SA 1-A

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SA1-C EXISTING VEGETATION

Common Name	Scientific Name
<i>Native</i>	
Red maple	<i>Acer rubrum</i>
Silver Maple	<i>Acer saccharinum</i>
Northern catalpa	<i>Catalpa speciosa</i>
White thoroughwort	<i>Eupatorium leucolepis</i>
Green ash	<i>Fraxinus pennsylvanica</i>
Swamp rose mallow	<i>Hibiscus palustris</i>
Smartweed	<i>Polygonum coccineum</i>
Eastern cottonwood	<i>Populus deltoides</i>
Staghorn Sumac	<i>Rhus typhina</i>
Black willow	<i>Salix nigra</i>
Late goldenrod	<i>Solidago gigantea</i>
Poison ivy	<i>Toxicodendron radicans</i>
Grapevine	<i>Vitis riparia</i>
<i>Exotic</i>	
Purple loosestrife	<i>Lythrum salicaria</i>
Common buckthorn	<i>Rhamnus cathartica</i>
Nightshade	<i>Solanum dulcamara</i>

E. Michigan Ave.

SA3-A EXISTING VEGETATION	
Common Name	Scientific Name
Native	
Box elder	<i>Acer negundo</i>
Silver Maple	<i>Acer saccharinum</i>
Common ragweed	<i>Ambrosia artemisiifolia</i>
Rush aster	<i>Aster junciformis</i>
Northern catalpa	<i>Catalpa speciosa</i>
Washington hawthorn	<i>Crataegus phaenopyrum</i>
Fowl meadow grass	<i>Glyceria striata</i>
Blue flag iris	<i>Iris versicolor</i>
Evening primrose	<i>Oenothera biennis</i>
Wood sorrel	<i>Oxalis montana</i>
Virginia Creeper	<i>Parthenocissus quinquefolia</i>
Eastern cottonwood	<i>Populus deltoides</i>
Staghorn Sumac	<i>Rhus typhina</i>
Thin-leaved coneflower	<i>Rudbeckia triloba</i>
Green foxtail	<i>Setaria viridis</i>
Late goldenrod	<i>Solidago gigantea</i>
Poison Ivy	<i>Toxicodendron radicans</i>
American elm	<i>Ulmus americana</i>
Violet	<i>Viola sp.</i>
Grapevine	<i>Vitis riparia</i>
Exotic	
Queen Anne's lace	<i>Daucus carota</i>
Reed canary grass	<i>Phalaris arundinacea</i>
Common buckthorn	<i>Rhamnus cathartica</i>
Nightshade	<i>Solanum dulcamara</i>
Common mullein	<i>Verbascum thapsus</i>
Myrtle	<i>Vinca minor</i>

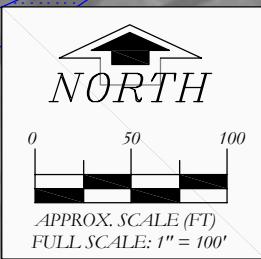
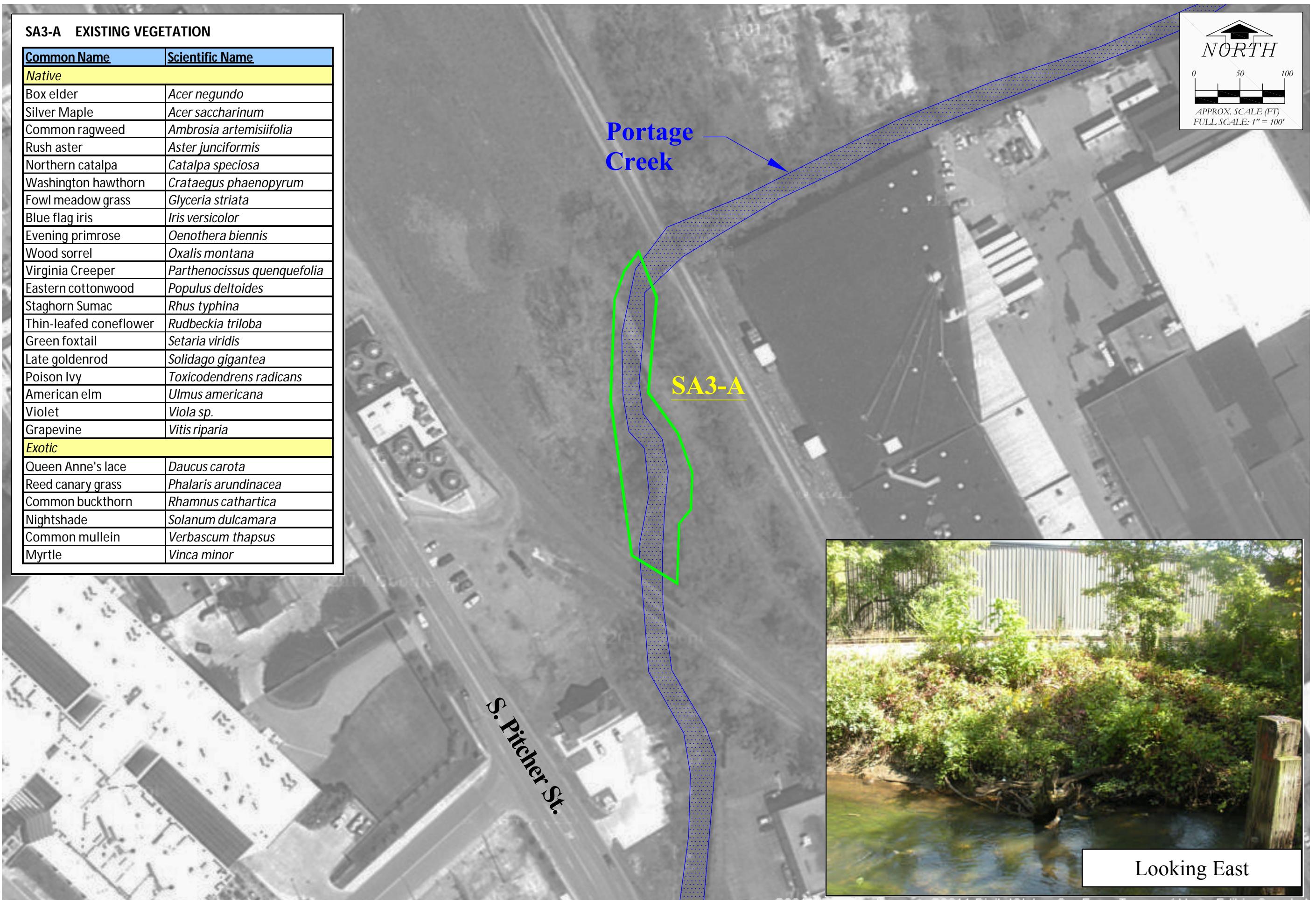


FIGURE
5

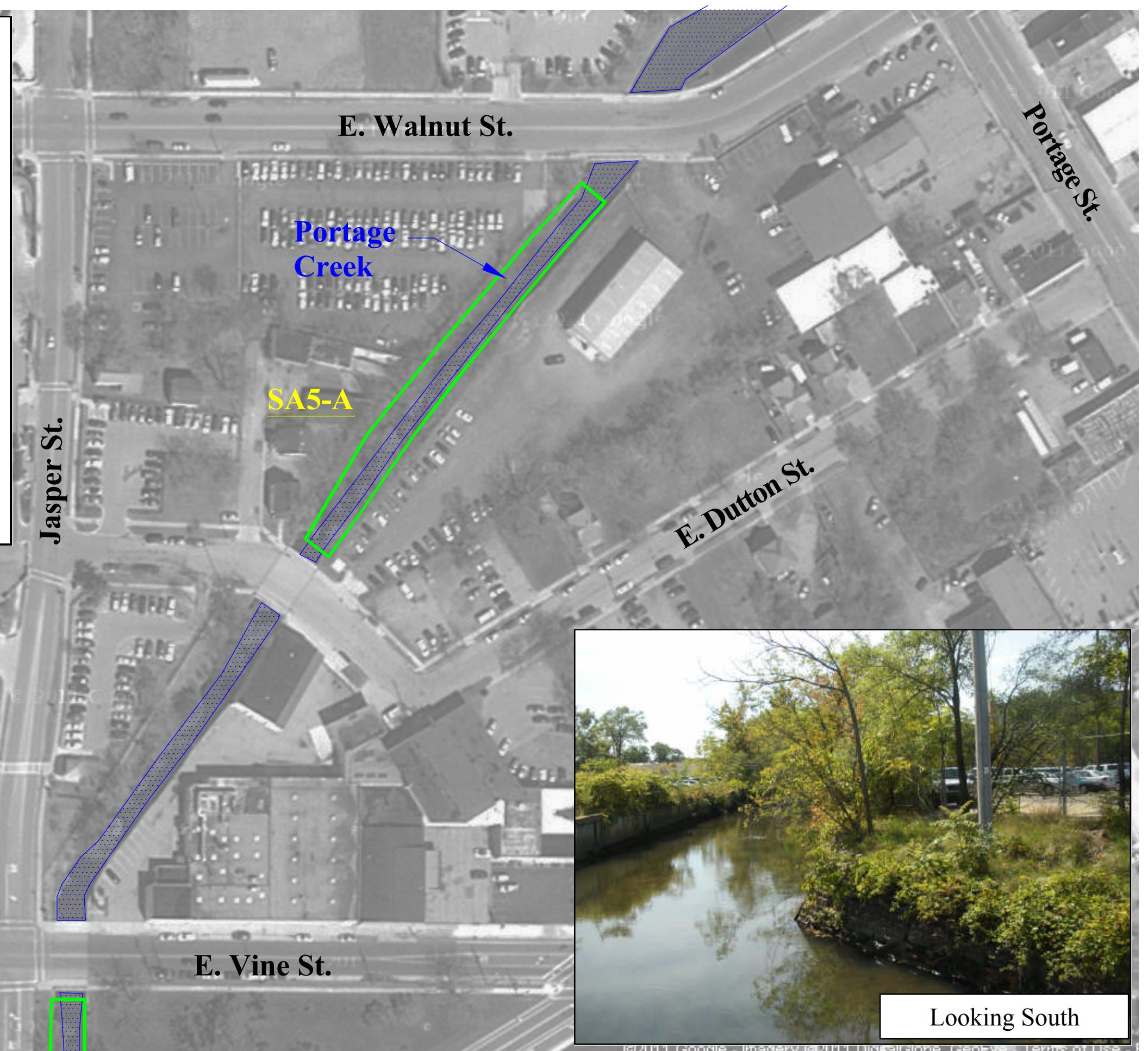
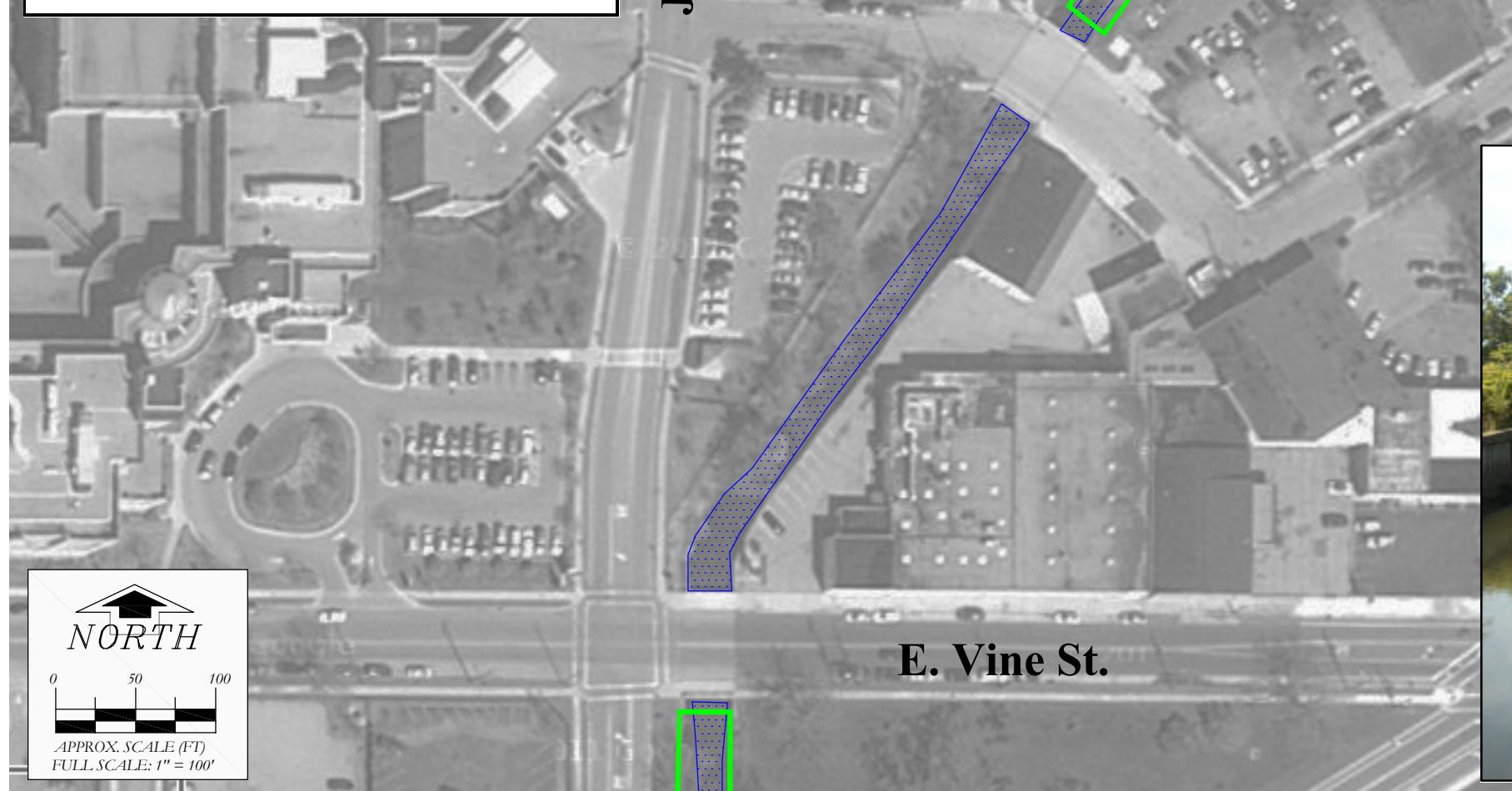
Portage Creek Area Time Critical Removal Action
KALAMAZOO, MI
EQM Project Number: O3O281.0087
PORTAGE CREEK SITE SA 3-A

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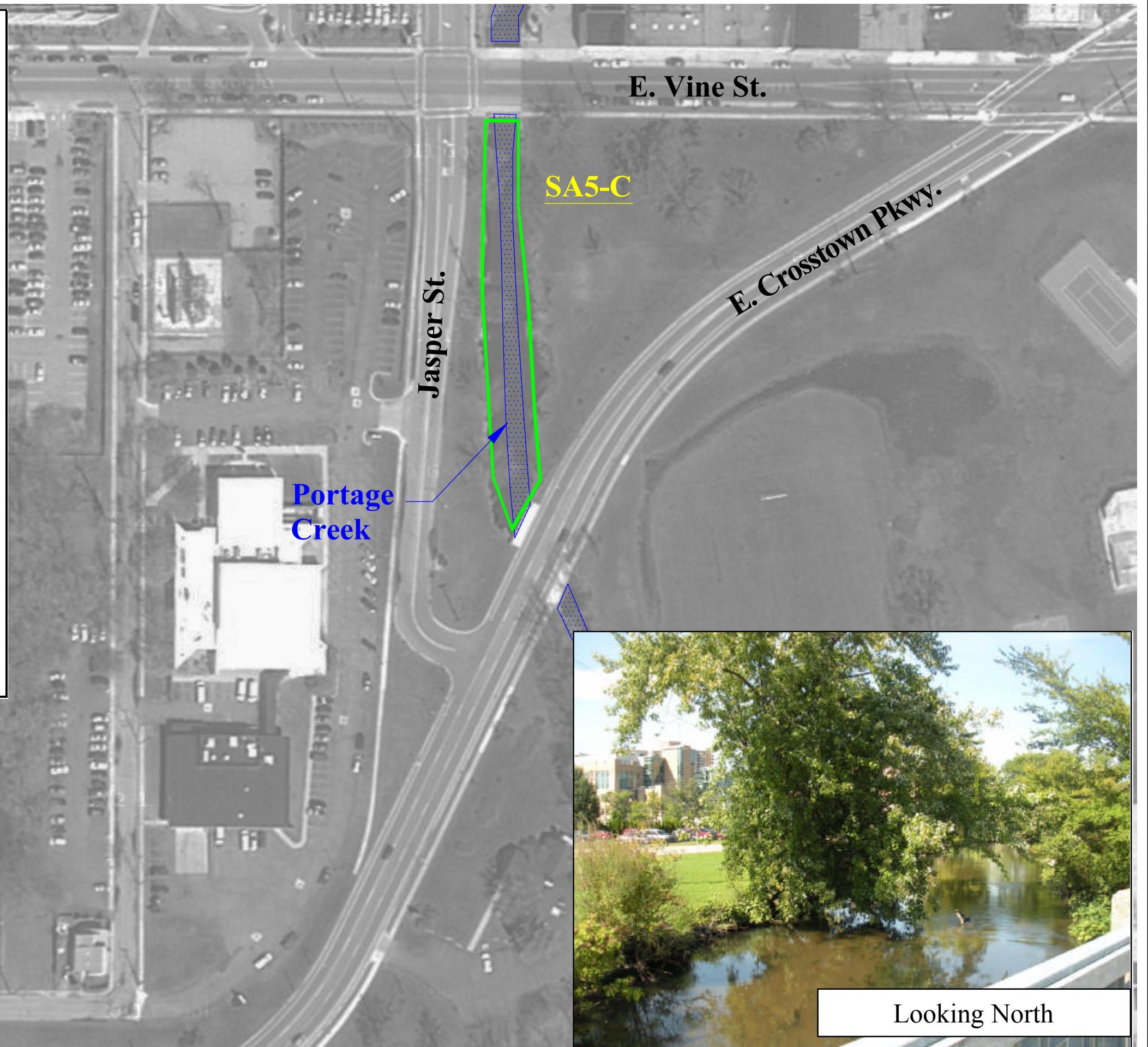
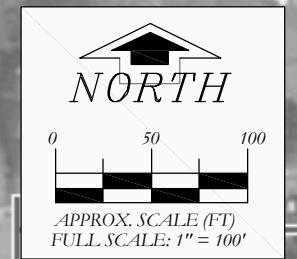
SA5-A EXISTING VEGETATION

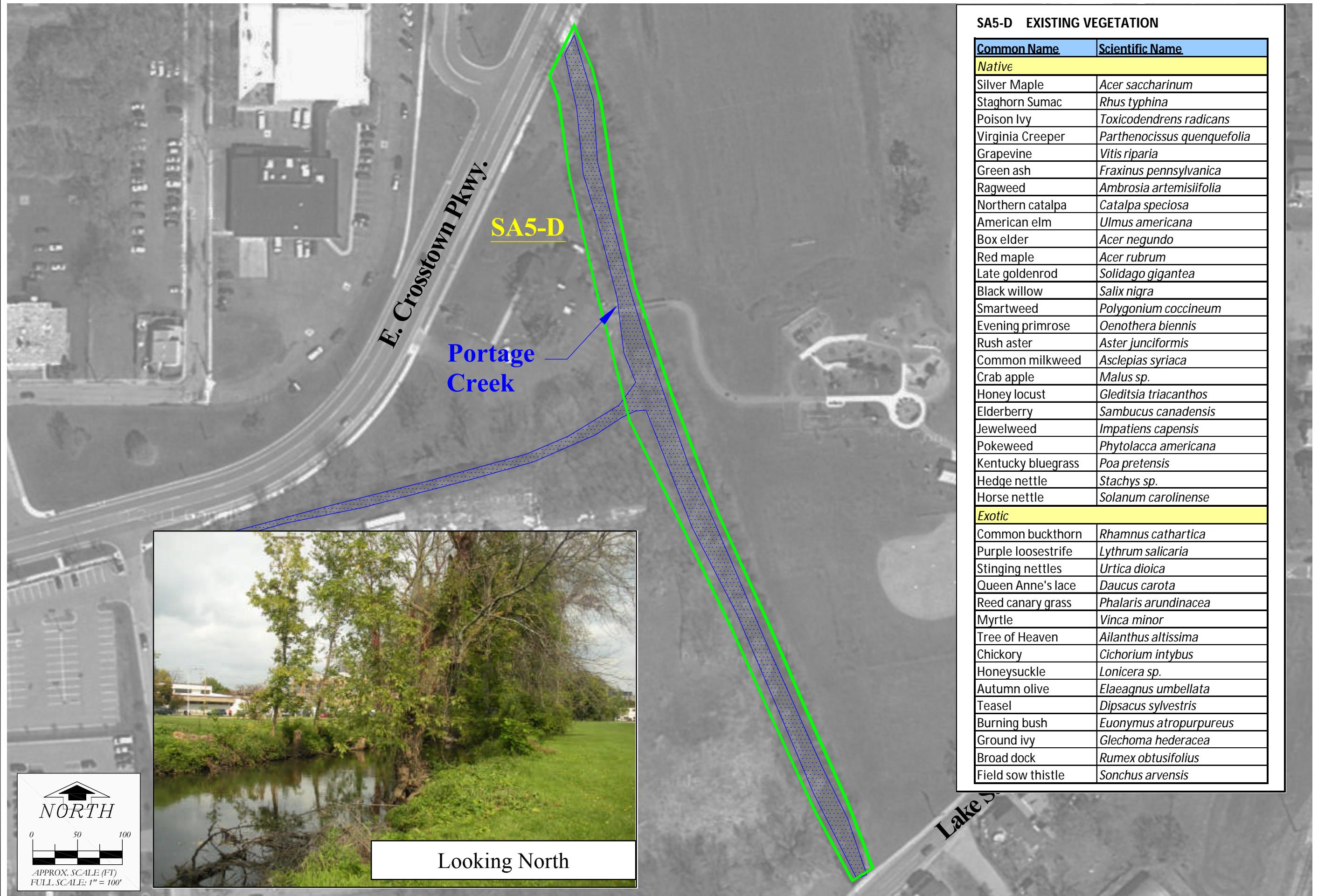
Common Name	Scientific Name
Native	
Staghorn Sumac	<i>Rhus typhina</i>
Grapevine	<i>Vitis riparia</i>
Green ash	<i>Fraxinus pennsylvanica</i>
Northern catalpa	<i>Catalpa speciosa</i>
American elm	<i>Ulmus americana</i>
Box elder	<i>Acer negundo</i>
Red maple	<i>Acer rubrum</i>
Eastern cottonwood	<i>Populus deltoides</i>
Common milkweed	<i>Asclepias syriaca</i>
Aster sp.	<i>Asteraceae</i>
Crab apple	<i>Malus sp.</i>
Exotic	
Common buckthorn	<i>Rhamnus cathartica</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Stinging nettles	<i>Urtica dioica</i>
Nightshade	<i>Solanum dulcamara</i>
Tree of Heaven	<i>Ailanthus altissima</i>
Curled dock	<i>Rumex crispus</i>

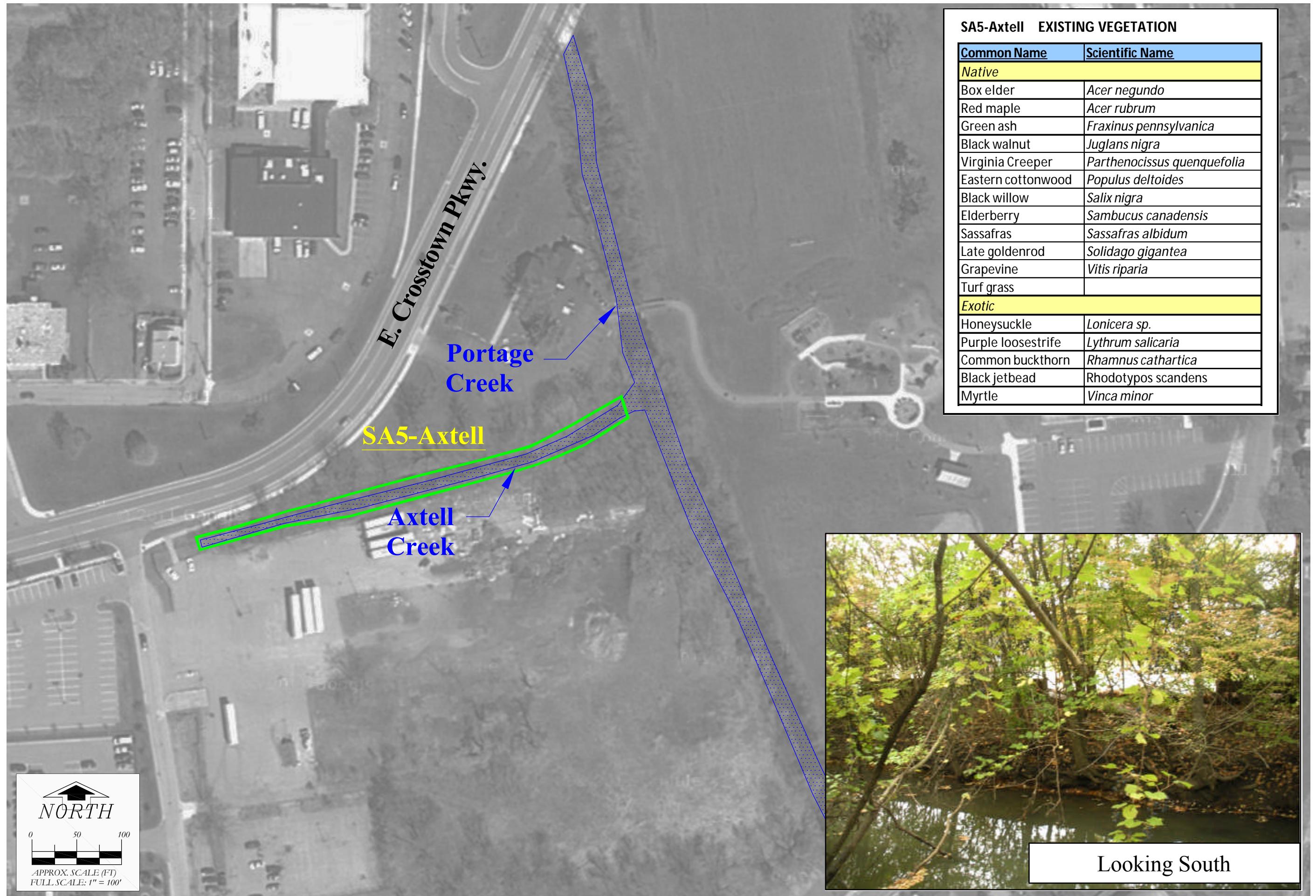


SA5-C EXISTING VEGETATION

Common Name	Scientific Name
Native	
Box elder	<i>Acer negundo</i>
Silver Maple	<i>Acer saccharinum</i>
Swamp milkweed	<i>Asclepias incarnata</i>
Rush aster	<i>Aster junciformis</i>
Hedge bindweed	<i>Convolvulus sepium</i>
Washington hawthorn	<i>Crataegus phaenopyrum</i>
Honey locust	<i>Gleditsia triacanthos</i>
Swamp rose mallow	<i>Hibiscus palustris</i>
Jewelweed	<i>Impatiens capensis</i>
Blue flag iris	<i>Iris versicolor</i>
Evening primrose	<i>Oenothera biennis</i>
Reed canary grass	<i>Phalaris arundinacea</i>
Pokeweed	<i>Phytolacca americana</i>
Smartweed	<i>Polygonum coccineum</i>
Water pepper (smartweed)	<i>Polygonum hydropiper</i>
Bur Oak	<i>Quercus macrocarpa</i>
Sweet coneflower	<i>Rudbeckia subtomentosa</i>
Arrowhead	<i>Sagittaria latifolia</i>
Elderberry	<i>Sambucus canadensis</i>
Poison ivy	<i>Toxicodendron radicans</i>
American elm	<i>Ulmus americana</i>
Grapevine	<i>Vitis riparia</i>
Exotic	
Chicory	<i>Cichorium intybus</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Common buckthorn	<i>Rhamnus cathartica</i>
Stinging nettles	<i>Urtica dioica</i>
Turf grass	

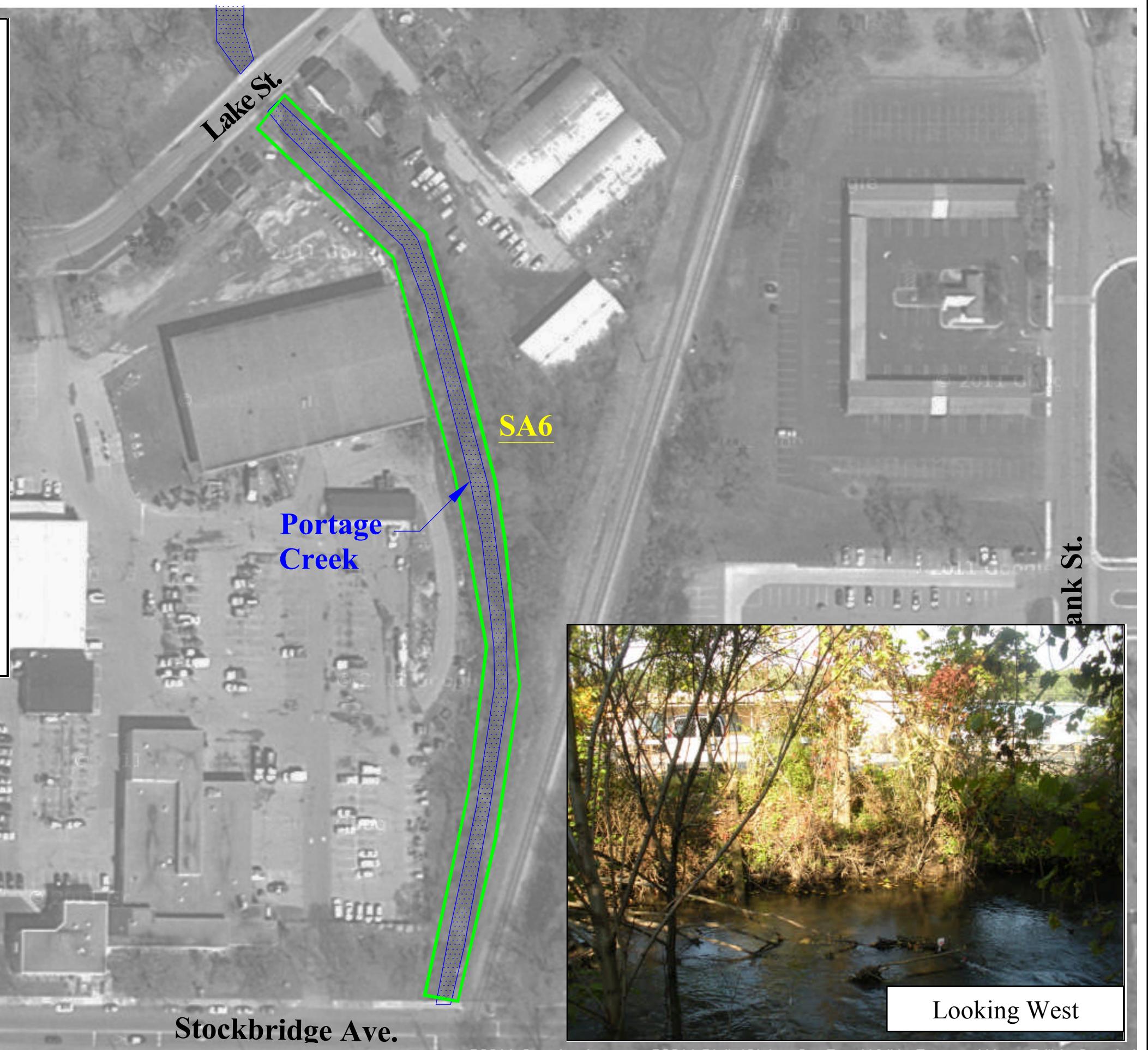
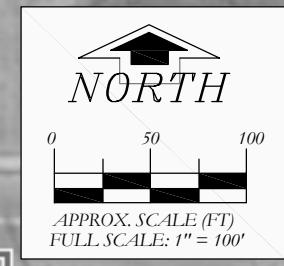






SA6 EXISTING VEGETATION

Common Name	Scientific Name
<i>Native</i>	
Box elder	<i>Acer negundo</i>
Silver Maple	<i>Acer saccharinum</i>
Common milkweed	<i>Asclepias syriaca</i>
Aster sp.	<i>Asteraceae</i>
Northern catalpa	<i>Catalpa speciosa</i>
Green ash	<i>Fraxinus pennsylvanica</i>
Honey locust	<i>Gleditsia triacanthos</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Virginia Creeper	<i>Parthenocissus quinquefolia</i>
Pokeweed	<i>Phytolacca americana</i>
Eastern cottonwood	<i>Populus deltoides</i>
Pin oak	<i>Quercus palustris</i>
Staghorn Sumac	<i>Rhus typhina</i>
Raspberry	<i>Rubus sp.</i>
Black willow	<i>Salix nigra</i>
Elderberry	<i>Sambucus canadensis</i>
Late goldenrod	<i>Solidago gigantea</i>
Poison ivy	<i>Toxicodendron radicans</i>
American elm	<i>Ulmus americana</i>
Grapevine	<i>Vitis riparia</i>
<i>Exotic</i>	
Burning bush	<i>Euonymus atropurpureus</i>
Japanese knotweed	<i>Fallopia Japonica</i>
Reed canary grass	<i>Phalaris arundinacea</i>
Common buckthorn	<i>Rhamnus cathartica</i>
Nightshade	<i>Solanum dulcamara</i>



SA7 EXISTING VEGETATION

Common Name	Scientific Name
Native	
Box elder	<i>Acer negundo</i>
Silver Maple	<i>Acer saccharinum</i>
Washington hawthorn	<i>Crataegus phaenopyrum</i>
Jewelweed	<i>Impatiens capensis</i>
Blue flag iris	<i>Iris versicolor</i>
Virginia Creeper	<i>Parthenocissus quinquefolia</i>
Reed canary grass	<i>Phalaris arundinacea</i>
Eastern cottonwood	<i>Populus deltoides</i>
Poison Ivy	<i>Toxicodendron radicans</i>
American elm	<i>Ulmus americana</i>
Grapevine	<i>Vitis riparia</i>
Violet	
Turf grass	
Exotic	
Burdock	<i>Arctium minus</i>
Common buckthorn	<i>Rhamnus cathartica</i>
Wide dock	<i>Rumex obtusifolius</i>
Stinging nettles	<i>Urtica dioica</i>
Myrtle	<i>Vinca minor</i>



FIGURE
11

Portage Creek Area Time Critical Removal Action
KALAMAZOO, MI
EQM Project Number: 030281.0087
PORTAGE CREEK SITE SA-7

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ATTACHMENT A

Select Photograph Documentation from each Portage Creek Project Site



Portage Creek Area Time Critical Removal Action

Kalamazoo, Michigan

Site Photographs

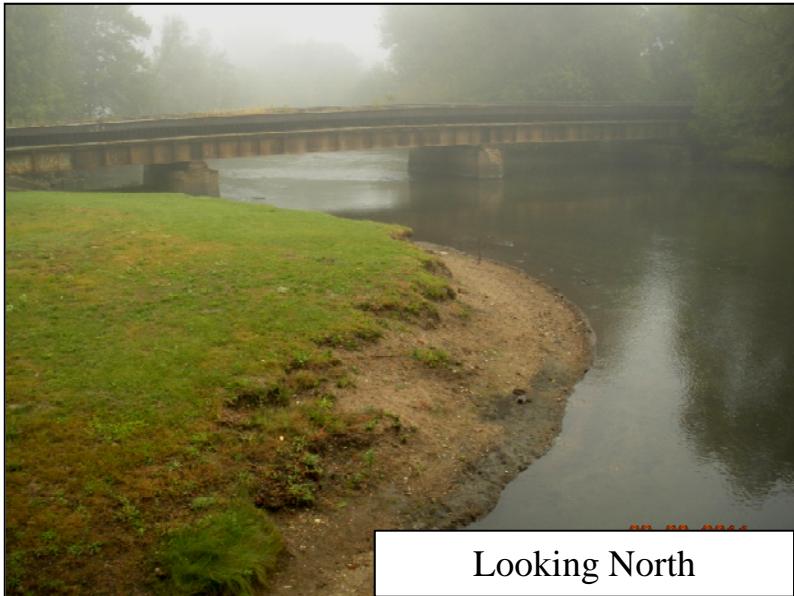
Existing Vegetation Observations

September 20 and 21, 2011

Photos taken by: P. Hoch-Melluish of Kieser & Associates, LLC

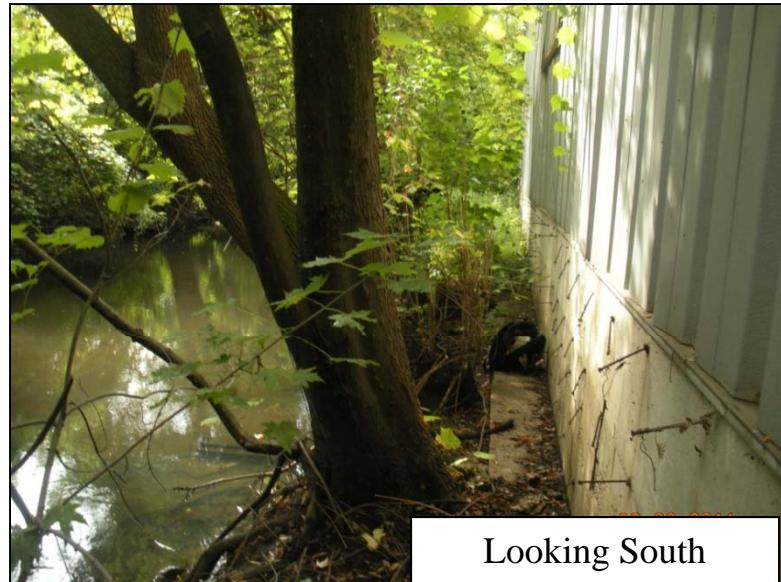
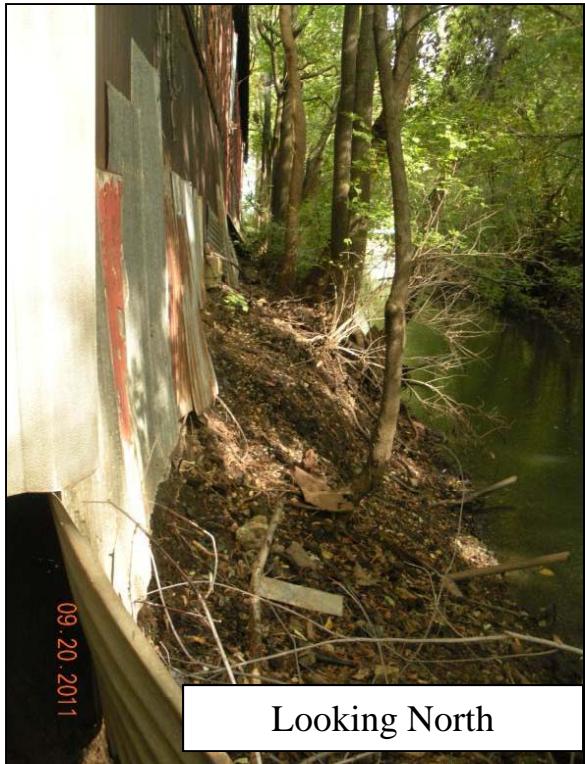
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Site SA 1-A Photographs

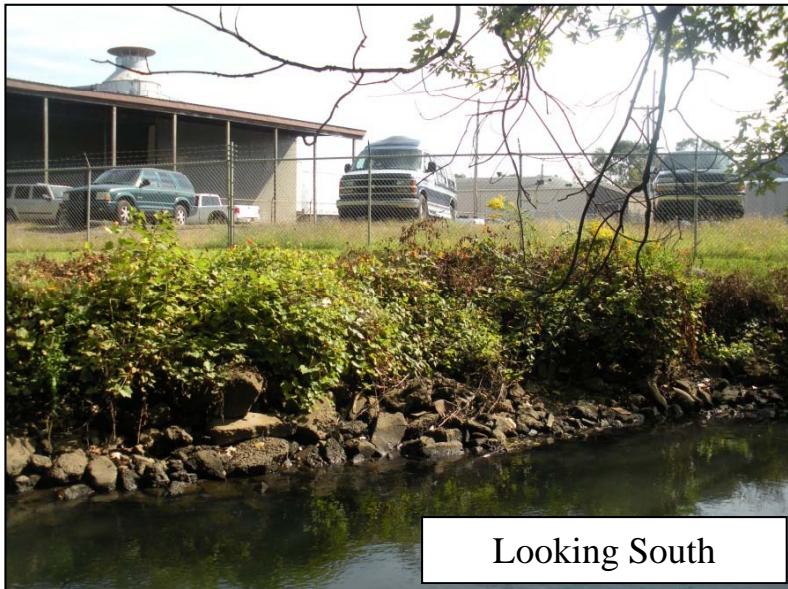
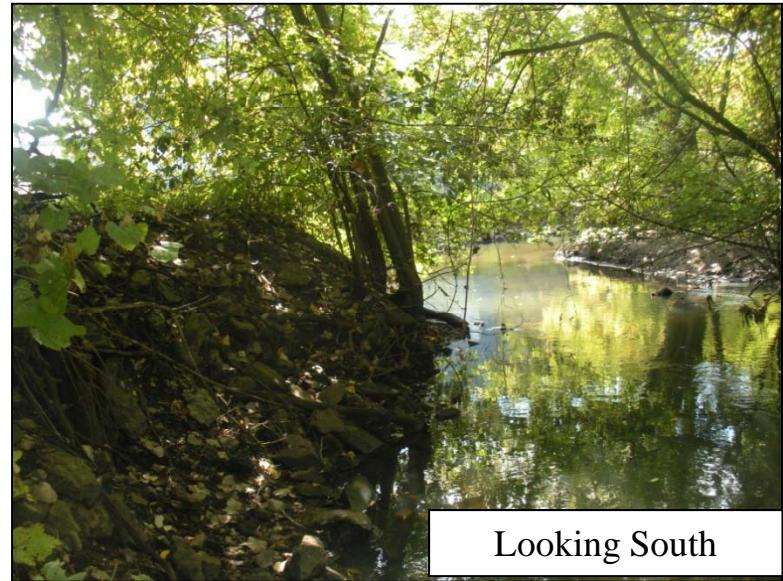


Kieser & Associates, LLC

Site SA 1-B Photographs



Site SA 1-C Photographs



Site SA 3-A Photographs



Looking East



Looking North

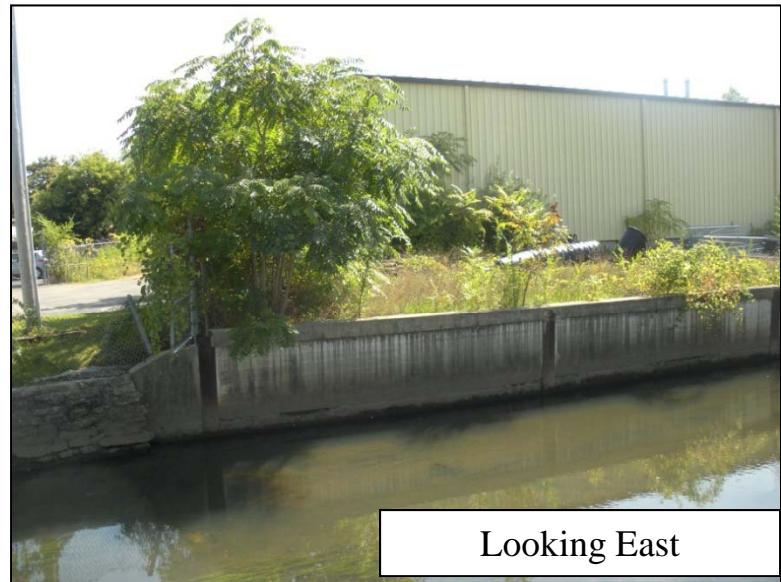


Looking East

Site SA 5-A Photographs



Looking West



Looking East



Looking South

Site SA 5-Axtell Photographs



Looking West



Looking South

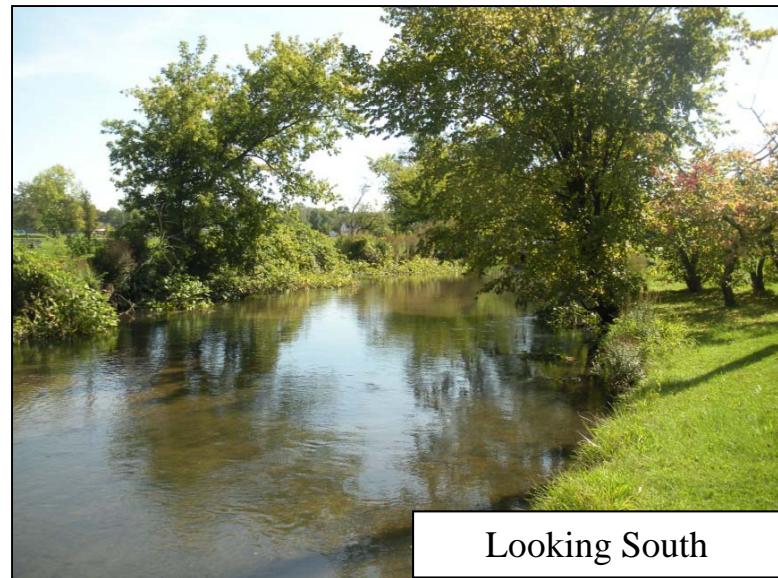
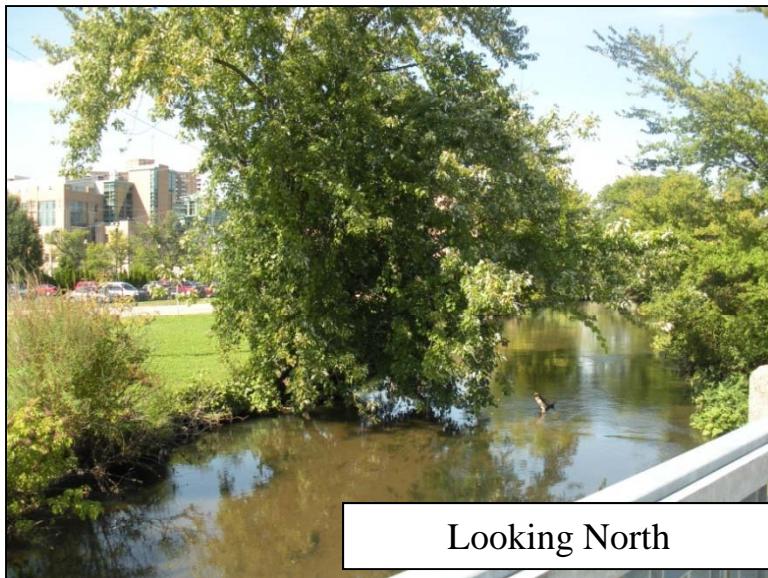
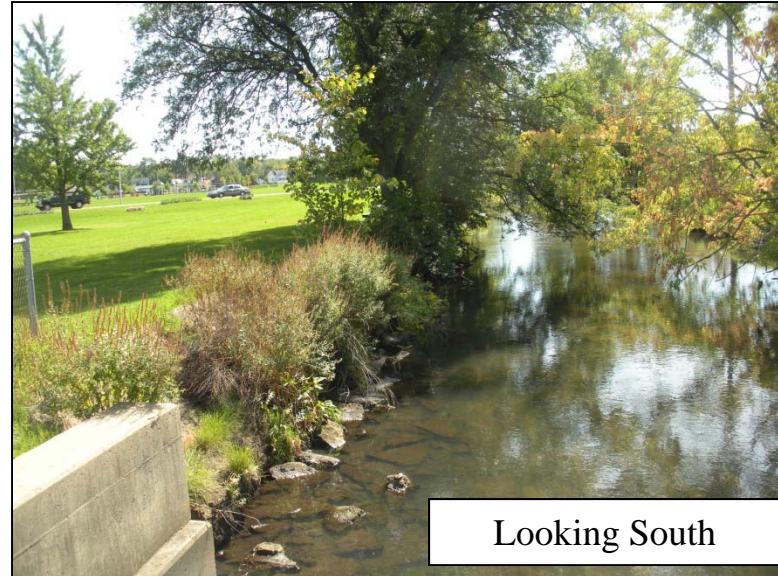
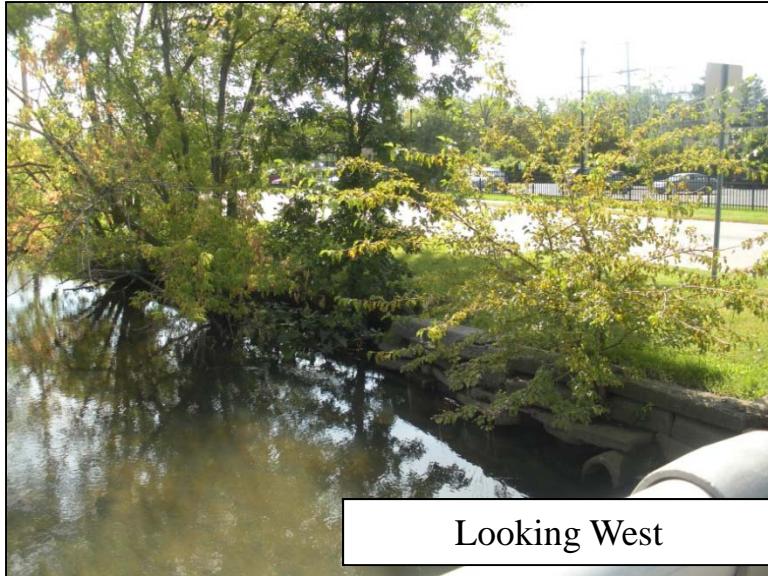


Looking South

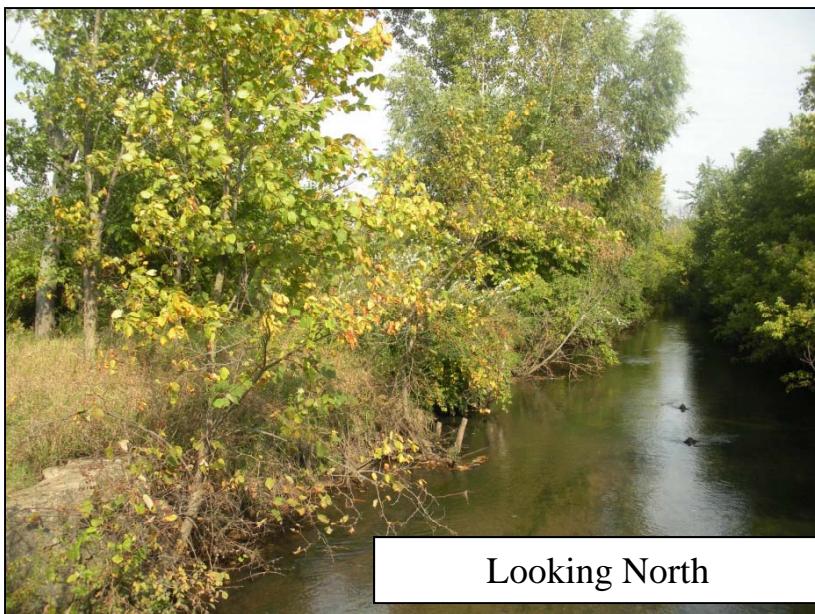


Looking East

Site SA 5-C Photographs

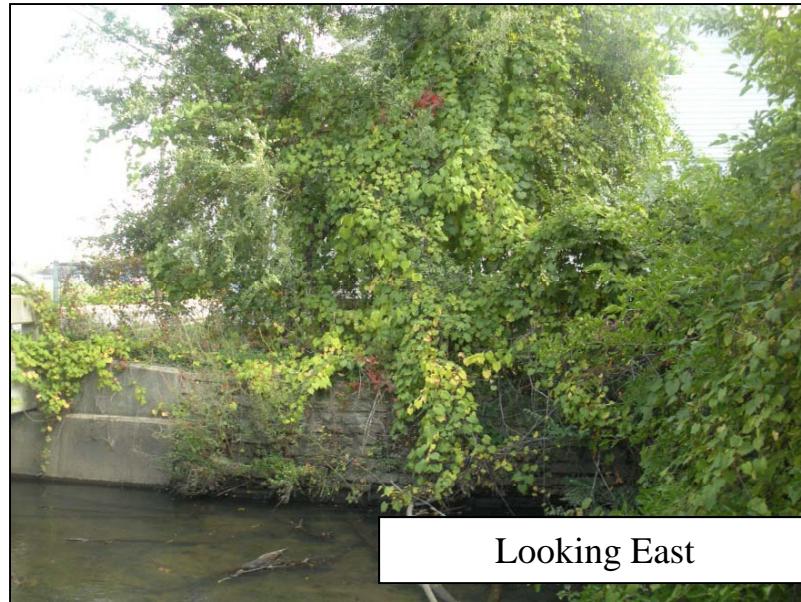


Site SA 5-D Photographs



Kieser & Associates, LLC

Site SA 6 Photographs



Kieser & Associates, LLC

Site SA 7 Photographs (photos provided by EQM)

